Claims:

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1. A cellular radio network comprising allocated radio frequencies reused in cells, characterized by

said allocated radio frequencies being divided into regular radio frequencies for which lower frequency reuse is utilized to achieve a seamless overall coverage, and super-reuse frequencies to which high frequency reuse is applied to provide a high traffic carrying capacity,

at least some of the cells having both at least one regular frequency and at least one super-reuse frequency, so that said at least one regular frequency is intended to serve primarily in cell boundary regions and said at least one super-reuse frequency is intended to serve primarily in the vicinity of the base station,

means controlling traffic load distribution in the cell between said at least one regular and said at least one super-reuse frequency by means of intra-cell handovers induced by estimated interference on said at least one super-reuse frequency.

2. A cellular radio network as claimed in Claim 1, characterized in that

the cause of a handover from a regular frequency to a super-reuse frequency is a sufficiently good interference level on the super-reuse frequency, and

the cause of a handover from a super-reuse frequency to a regular frequency is too poor an interference level on the super-reuse frequency.

3. A system as claimed in Claim 1 or Claim 2, characterized in that

the BCCH frequency of the cell is always a regular frequency, and that the radio frequency assigned in call-setup or a handover from another cell is always a regular frequency.

4. A cellular radio network as claimed in Claim 1, characterized in that it further comprises at least one microcell having only super-reuse frequencies one of which is a BCCH frequency, and that call set-up in the microcell is barred, and the cellular network comprises means for controlling traffic load distribution between regular cells and the microcell by means of inter-cell handovers induced by the interference level in the microcell.

5. A cellular radio network as claimed in ~~any one of the preceding~~ claim 1 claims, comprising a mobile-assisted handover procedure in which the mobile station (MS) measures the signal receiving level of the serving cell and the signal level of the adjacent cells and forwards the measurement results to the handover controller means of the cellular network,

characterized in that the handover controller means is adapted to estimate the interference level on the super-reuse frequencies of the serving cell on the basis of the measurement results.

6. A cellular radio network as claimed in Claim 5, characterized in that one or more adjacent cells have been assigned to each super-reuse frequency of the serving cell, the measured receiving level of the adjacent cell being used for estimating the interference on said super-reuse frequency.

7. A cellular radio network as claimed in Claim 5 ~~or Claim 6,~~ characterized in that the measurement results of the mobile station only concern a limited number of ambient cells, and that at least one reference cell has been assigned to at least one super-reuse frequency of the serving cell from among said ambient cells, said reference cell having an interference profile of a similar type as a more remote cell which is a potential source of interference on the super-reuse frequency but cannot be directly measured by the mobile station, and that the handover controller means is adapted to estimate the level of interference caused by said more remote cell on the super-reuse frequency, using the measured signal level of the reference cell.

8. A cellular radio network as claimed in Claim 7, characterized in that the handover algorithm is adapted to estimate the signal level of the interfering cell by correcting the measured receiving level of the reference cell taking into account the difference in the signal levels of the reference cell and the actual interfering cell.

9. A method for increasing traffic carrying capacity in a cellular radio system, characterized in that it comprises the steps of

dividing the radio frequencies of the cellular radio network into regular radio frequencies for which lower frequency reuse is utilized to achieve seamless overall coverage, and super-reuse frequencies to which higher frequency reuse is applied to provide a high traffic carrying capacity,

allocating to at least some of the cells both at least one regular frequency and at least one super-reuse frequency so that the regular frequency

is intended to serve primarily in cell boundary regions and the super-reuse frequency is intended to serve primarily in the vicinity of the base station,

controlling traffic load distribution in the cell between said at least one regular and said at least one super-reuse frequency by means of intra-cell handovers induced by estimated interference on said at least one super-reuse frequency.

10. A method as claimed in Claim 9, characterized by

performing an intra-cell handover from a regular frequency to a super-reuse frequency when the super-reuse frequency has a sufficiently good interference level, and

performing a handover from a super-reuse frequency to a regular frequency when the super-reuse frequency has too poor an interference level.

11. A method as claimed in Claim 9 ~~or Claim 10~~, characterized by

allocating a regular frequency as the BCCH frequency of the cell in each case,

assigning a regular frequency in call set-up or in a handover from another cell in each case.

12. A method as claimed in Claim 9, ~~10 or 11~~, characterized by

measuring the signal receiving level, preferably also the quality, of the serving cell at the mobile station,

measuring the signal receiving level of the cells ambient to the serving cell at the mobile station,

forwarding the measurement results from the mobile station to the cellular radio network,

estimating the interference level on the super-reuse frequencies of the serving cell on the basis of the measurement results.

13. A method as claimed in Claim 12, characterized by

assigning one or more adjacent cells to each super-reuse frequency of the serving cell, the measured receiving level of the adjacent cell being used for estimating the interference level on said super-reuse frequency.

14. A method as claimed in Claim 12 ~~or Claim 13~~, characterized by

the measurement results reported by the mobile station only concerning a limited number of ambient cells,

assigning at least one reference cell to at least one super-reuse frequency of the serving cell from among said ambient cells, said reference cell having an interference profile of a similar type as a more remote cell which is a potential source of interference on the super-reuse frequency but cannot be directly measured by the mobile station,

estimating the level of interference caused by said more remote cell on the super-reuse frequency, using the measured signal level of the reference cell.

15. A method as claimed in Claim 14, characterized by

correcting the measured signal level of the reference cell taking into account the difference in the signal levels of the reference cell and said remote cell in the estimation of the interference level.